

WHAT IS CLAIMED IS:

1. An image compression apparatus comprising:  
transformation prediction difference processing  
means for subjecting a referable pixel present around the  
periphery of a pixel to be predicted to special  
reversible S (Sequential) transformation, which is  
transformation including shift transformation and  
constant-range transformation and using a transformation  
coefficient that satisfies a condition for reversibility,  
according to context modeling that performs adaptive  
processing on the basis of context of the referable  
peripheral pixel, thereby calculating an initial  
prediction value of said pixel to be predicted, and also  
quantizing said context after said special reversible S  
transformation;

prediction error calculating means for performing  
prediction correction on the basis of said context and  
then calculating a prediction error to encode an image  
signal; and

entropy encoding means for subjecting said encoded  
image signal to entropy encoding.

2. An image compression apparatus as claimed in  
claim 1,

wherein said transformation prediction difference

processing means further provides prediction correction for said image signal at the time of said special reversible S transformation.

3. An image compression apparatus as claimed in claim 2,

wherein processing of providing said prediction correction makes prediction by optimum adaptive processing using an optimum adaptive processing coefficient that maximizes rating of correlation between referable pixels present around the periphery of said pixel to be predicted and thereby provides the correction.

4. An image compression apparatus as claimed in claim 1,

wherein said transformation prediction difference processing means calculates an optimum adaptive processing coefficient that maximizes rating of correlation between elements of transformation coefficients used when said special reversible S transformation is performed, and performs optimum prediction calculation processing on the basis of said optimum adaptive processing coefficient.

5. An image compression apparatus as claimed in claim 4,

wherein said optimum adaptive processing is

performed by adding a representative coefficient that maximizes said rating of correlation.

6. An image compression apparatus as claimed in claim 1,

wherein said transformation prediction difference processing means extracts and quantizes context of the transformation coefficient used when said special reversible S transformation is performed, and thereby calculates transformation coefficient context.

7. An image compression apparatus as claimed in claim 6,

wherein said transformation prediction difference processing means quantizes the context in each predetermined range corresponding to distribution of said transformation coefficient according to said distribution.

8. An image compression method for performing reversible image compression, which preserves original information after processes of compression and expansion, said image compression method comprising the steps of:

subjecting a referable pixel present around the periphery of a pixel to be predicted to special reversible S (Sequential) transformation, which is transformation including shift transformation and constant-range transformation and using a transformation

coefficient that satisfies a condition for reversibility, according to context modeling that performs adaptive processing on the basis of context of said referable peripheral pixel, thereby calculating an initial prediction value of said pixel to be predicted, and also quantizing said context;

making adaptive correction of the initial prediction value of said pixel to be predicted using said context and then calculating a prediction error to encode an image signal; and

subjecting said encoded image signal to entropy encoding, which reflects said context as required, to thereby generate a compressed image signal.